

CLAIMS

1. Method of thin film deposition by plasma, on the surface of an object to be treated, comprising the generation
5 of plasma in one or more inert plasmagenic gases and precursor gases, and projection of said plasma onto the surface to be treated, characterized in that the precursor gas or gases comprise at least two components, a first of said components containing saturated organic substances and a second of said
10 components containing unsaturated organic substances, the first component being a source of light radicals with a single free bond, subsequent to a plasmochemical process in the plasma zone, and the second component being a source of heavy radicals with two or more free bonds.

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2. Method as in claim 1, characterized in that the precursor gases contain carbon, hydrogen and halogens.

3. Method as in the preceding claim, characterized in
20 that the halogen is fluorine and in that a layer of Teflon is deposited.

4. Method as in claim 1, characterized in that the precursor gases contain carbon and hydrogen.

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5. Method as in the preceding claim, characterized in that a layer of polyethylene is deposited.

6. Method as in any of the preceding claims,
30 characterized in that the plasma is generated at atmospheric pressure.

7. Method as in any of the preceding claims, characterized in that the plasma is generated by pulses of electric current, the growth front and the duration of pulses being controlled in order to generate discharges that are not
5 in thermodynamic equilibrium.

8. Method as in any of the preceding claims, characterized in that the plasma is sequentially supplied with different precursor gases in order to deposit a multilayer
10 film, of variable composition over its thickness.

9. Method as in any of the preceding claims, characterized in that the flow of the precursor gases is controlled to optimise the rate of film deposit and the gas
15 and liquid barrier strength of the film.

10. Device for implementing the method as in any of the preceding claims, characterized in that it includes plasma generators comprising electrodes to create the electric
20 discharge supplied by a current source, and a system supplying at least two precursor gases, the generator being arranged in the enclosure of a reactor (14), the device also comprising a kinematical system to convey the objects to be treated through the plasma flow generated by the generators, the device
25 operating under atmospheric pressure, characterized in that the kinematical system conveying the objects to be treated comprises a conveyor belt (23) in the form of a grid or mesh to allow surface treatment over the entire periphery of the object to be treated.

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11. Device for implementing the method as in any of claims 1 to 9, characterized in that it includes plasma generators comprising electrodes to create the electric

discharge supplied by a current source, and a system supplying at least two precursor gases, the generator being arranged in the enclosure of a reactor (14), the device also comprising a kinematical system to convey the objects to be treated through the plasma flow generated by the generators, the device operating at atmospheric pressure, characterized in that the device comprises guiding elements (24) to guide the flow of objects to be treated through the plasma flows of the plasma generators arranged along the reactor, the conveying of the objects to be treated being made under gravity or hydrodynamic flow.

12. Device as in claim 11, characterized in that the treatment is conducted on the surface of objects of small size accumulated in a container through which, from bottom to top, the plasma-derived gases flow so as to form a boiling layer ensuring treatment of the entire surface of each of the objects.